

## **PCT**

## WORLD INTELLECTUAL PROPERTY ORGANIZATION International Bureau



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6:		(11) International Publication Number: WO 98/01100
A61K 31/365	A3	(43) International Publication Date: 15 January 1998 (15.01.98)
(21) International Application Number: PCT/US97.  (22) International Filing Date: 3 July 1997 (03)  (30) Priority Data: 60/021,420 9 July 1996 (09.07.96) 9617898.3 28 August 1996 (28.08.96) 60/029,351 31 October 1996 (31.10.96)  (71) Applicant (for all designated States except US): MEE CO., INC. [US/US]; 126 East Lincoln Avenue, Rahvo 07065 (US).  (72) Inventors; and (75) Inventors/Applicants (for US only): MITCHEL, Y. [US/US]; 126 East Lincoln Avenue, Rahway, NJ (US). TOBERT, Jonathan, A. [US/US]; 126 East I Avenue, Rahway, NJ 07065 (US).  (74) Common Representative: MERCK & CO., INC.; 12 Lincoln Avenue, Rahway, NJ 07065 (US).	3.07.9°  GU  RCK  way, N	CA, CN, CU, CZ, EE, GE, HU, IL, IS, JP, KG, KR, KZ, LC, LK, LR, LT, LV, MD, MG, MK, MN, MX, NO, NZ, PL, RO, RU, SG, SI, SK, SL, TJ, TM, TR, TT, UA, US, UZ, VN, YU, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).  Published  With international search report.  Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.  (88) Date of publication of the international search report:  12 February 1998 (12.02.98)

#### (54) Title: METHOD FOR TREATING HOMOZYGOUS FAMILIAL HYPERCHOLESTEROLEMIA

#### (57) Abstract

Homozygous familial hypercholesterolemia can be treated in patients suffering with this condition by administering a therapeutically effective amount of simvastatin. Dosages above 40 mg/day, and more particularly at or above 80 mg/day, were found to effectively reduce the LDL cholesterol levels in these patients.

## FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	es	Spain	LS	Lesotho	St	ZIOAEDIS
AM	Armenia	, Ft	Pintand	LT	Lithumia	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Sweziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
ВВ	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav	TM	Turkmenistan
BF	Burkina Paso	GR	Greece		Republic of Macedonia	TR	Turkey
BG	Bulgaria	HU	Hungary	ML	Mali	TT	Trinidad and Tobago
BJ	Benia	IE	Ircland	MN	Mongolia	UA	Ukraine
BR	Brazil	IL	Israel	MR	Mauritania	UG	Uganda
BY	Belarus	18	Iceland	MW	Malawi	บร	United States of America
CA	Canada	IT	kaly	MX	Mexico	UZ	Uzbekistan
CP CP	Central African Republic	JP	Japan	NE	Niger	VN	Vict Nam
CG	Congo	KE	Kenya	NL	Netherlands	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NO	Norway	ZW	Zimbabwe
a	Côte d'Ivoire	KP	Democratic People's	NZ	New Zealand		
CM	Cameroon		Republic of Korea	PL	Poland		
CN	China	KR	Republic of Korea	PT	Portugal		•
Cυ	Cuba	ΚZ	Kazakstan	RO	Romania		
cz	Czech Republic	LC	Saint Lucia	RU	Russian Federation		
DE	Germany	и	Liechtenstein	SD	Sudan		
DK	Denmark	LK	Sri Lanka	SE	Sweden		
EE	Estonia	LR	Liberia	SG	Singapore		

### INTERNATIONAL SEARCH REPORT

International application No. PCT/US97/11792

A. CL. IPC(6) US CL	ASSIFICATION OF SUBJECT MATTER :A61K 31/365 :514/460					
According to International Patent Classification (IPC) or to both national classification and IPC						
B. FIE	LDS SEARCHED					
Minimum	documentation searched (classification system follow	wed by classification symbols)				
U.S. :	· · · · · · · · · · · · · · · · · · ·					
Documents	tion searched other than minimum documentation to	the extent that such documents are included	d in the fields searched			
	data base consulted during the international search (	name of data base and, where practicable	, search torms used)			
C. DOC	CUMENTS CONSIDERED TO BE RELEVANT					
Category*	Citation of document, with indication, where a	appropriate, of the relevant passages	Relevant to claim No.			
X	Randomised trial of cholesterol lov coronary heart disease: the Scandinav (4S). Lancet. November 1994, Vol. (Abstract).	ian Simvastatin Survival Study	1-9			
A	US, 5,393,893 A (KUBELA et al.) 28 February 1995, see entire document.					
A	US, 4,997,849 A (PETUCH et al.) 05 March 1991, see entire 1-9 document.					
	<del></del> ,	↑ <b>↑</b>	·			
Furthe	or documents are listed in the continuation of Box C	C. See patent family annex.				
Spe	eist estagories of eitad documents;	*T* leter document published after the inner	metional filing date or priority			
	nument defining the general state of the art which is not considered to of particular relevance	dete and not in conflict with the application the principle or theory underlying the	nation but cited to understand			
'E' eart	ier document published on or after the international filing data umant which may throw doubts on priority claim(s) or which is	"X" document of particular relevance; the considered novel or cannot be considered when the document is taken alone	eleizaed invention enanot be ad to involve an inventive step			
or does	Character of the state of the s					
being obvious to a person skilled in the ert  P* document published prior to the international filing date but later than *a*document member of the same petent family the priority date elasted						
Oate of the a	ctual completion of the international search  ABER 1997	Date of mailing of the international sear	ch report			
	ailing address of the ISA/US or of Patents and Trademarks	Authorized officer JAMES H. REAMER	NO I			
waanington, acsimile No		Telephone No. (703) 308 1235	hur			

185/39/61
DIALOG(R)File 345:Inpadoc/Fam.& Legal Stat
(c) 2001 EPO. All rts. reserv.

#### 13245748

Basic Patent (No, Kind, Date): GB 9617898 A0 19961009 <No. of Patents: 007> Patent Family:

Patent No	Kind	Date	Applic No	Kind	Date		
AU 9736672	A1	19980202	AU, 9736	572	Α	19970703	
AU 9742289	A1	19980202	AU 97422	289	· A	19970703	
AU 9743261	A1	19980202	AU 97432	261	A	19970703	
GB 9617898	A0	19961009	GB 96178	398	A	19960828	(BASIC)
WO 9801116	A1	19980115	WO 97US:	124,26	Α	19970703	
WO 9801100	A2	19980115	WO 97US:	11792	Α	19970703	
WO 9801119	A2	19980115	WO 97US	10867	Α	19970703	

Priority Data (No, Kind, Date):

GB 9617898 A 19960828

US 21420 P 19960709

US 29351 P 19961031

WO 97US12426 W 19970703

WO 97US11792 W 19970703

```
PATENT FAMILY:
AUSTRALIA (AU)
  Patent (No, Kind, Date): AU 9736672 A1 19980202
   THERAPY FOR COMBINED HYPERLIPIDEMIA (English)
   Patent Assignee: MERCK & CO INC
   Author (Inventor): MITCHEL YALE B; MELINO MICHAEL R
   Priority (No, Kind, Date): GB 9617898 A 19960828; US 21420 P
     19960709; US 29351 P 19961031; WO 97US12426 W 19970703
   Applic (No, Kind, Date): AU 9736672 A 19970703
   IPC: * A61K-009/20
   CA Abstract No: * 128(09)097715J; 128(09)097716K; 128(11)132435S
   Derwent WPI Acc No: * C 98-110203; C 98-110207; C 98-145191
   Language of Document: English
  Patent (No, Kind, Date): AU 9742289 A1 19980202
   METHOD FOR TREATING HOMOZYGOUS FAMILIAL HYPERCHOLESTEROLEMIA (English)
   Patent Assignee: MERCK & CO INC
   Author (Inventor): MITCHEL YALE B; TOBERT JONATHAN A
   Priority (No, Kind, Date): GB 9617898
                                          A 19960828; US 21420 P
     19960709; US 29351 P 19961031; WO 97US11792 W 19970703
   Applic (No, Kind, Date): AU 9742289 A 19970703
   IPC: * A61K-031/00
   CA Abstract No: * 128(09)097715J; 128(09)097716K; 128(11)132435S
   Derwent WPI Acc No: * C 98-110203; C 98-110207; C 98-145191
   Language of Document: English
  Patent (No, Kind, Date): AU 9743261 A1 19980202
   PHARMACEUTICAL COMPOSITIONS (English)
   Patent Assignee: MERCK & CO INC
   Author (Inventor): MITCHEL YALE B; TOBERT JONATHAN A
   Priority (No, Kind, Date): GB 9617898 A 19960828; US 21420 P
     19960709; US 29351 P 19961031; WO 97US10867 W 19970703
   Applic (No, Kind, Date): AU 9743261 A 19970703
   IPC: * A61K-031/00
   CA Abstract No: * 128(09)097715J; 128(09)097716K; 128(11)132435S
   Derwent WPI Acc No: * C 98-110203; C 98-110207; C 98-145191
   Language of Document: English
GREAT BRITAIN (GB)
 Patent (No, Kind, Date): GB 9617898 A0 19961009
   METHOD FOR TREATING HOMOZYGOUS FAMILIAL HYPERCHOLESTEROLEMIA (English)
   Patent Assignee: MERCK & CO INC
   Priority (No, Kind, Date): GB 9617898 A 19960828
   Applic (No, Kind, Date): GB 9617898 A 19960828
   Language of Document: English
WORLD INTELLECTUAL PROPERTY ORGANIZATION, PCT (WO)
  Patent (No, Kind, Date): WO 9801116 A1 19980115
   THERAPY FOR COMBINED HYPERLIPIDEMIA (English)
   Patent Assignee:
                      MERCK & CO INC (US); MITCHEL YALE B (US); MELINO
     MICHAEL R (US)
   Author (Inventor): MITCHEL YALE B (US); MELINO MICHAEL R (US)
   Priority (No, Kind, Date): GB 9617898 A 19960828; US 21420 P
     19960709; US 29351 P 19961031
   Applic (No, Kind, Date): WO 97US12426 A 19970703
   Designated States: (National) AL; AM; AU; AZ; BB; BG; BR; BY; CA; CN;
      CZ; EE; GE; HU; IL; IS; JP; KG; KR; KZ; LK; LR; LT; LV; MD; MG; MK;
```

```
MN; MX; NO; NZ; PL; RO; RU; SG; SI; SK; SL; TJ; TM; TR; TT; UA; US;
    UZ; VN; YU; AM; AZ; BY; KG; KZ; MD; RU; TJ; TM
                                                    (Regional) GH; KE;
    LS; MW; SD; SZ; UG; ZW; AT; BE; CH; DE; DK; ES; FI; FR; GB; GR; IE;
    IT; LU; MC; NL; PT; SE; BF; BJ; CF; CG; CI; CM; GA; GN; ML; MR; NE;
   SN; TD; TG
 Filing Details: WO 100000 With international search report
 IPC: * A61K-009/20
                       128(09)097715J; 128(09)097716K; 128(11)132435S;
 CA Abstract No: *
   128(09)097716K
 Derwent WPI Acc No: * C 98-110203; C 98-110207; C 98-145191; C
   98-110207
 Language of Document: English
Patent (No, Kind, Date): WO 9801100 A2 19980115
 METHOD FOR TREATING HOMOZYGOUS FAMILIAL HYPERCHOLESTEROLEMIA (English)
                    MERCK & CO INC (US); MITCHEL YALE B (US); TOBERT
 Patent Assignee:
              (US)
   JONATHAN A
 Author (Inventor): MITCHEL YALE B (US); TOBERT JONATHAN A
 Priority (No, Kind, Date): GB 9617898
                                        Α
                                               19960828; US 21420 P
   19960709; US 29351 P 19961031
 Applic (No, Kind, Date): WO 97US11792 A
                                         19970703
 Designated States: (National) AL; AM; AU; AZ; BA; BB; BG; BR; BY; CA;
    CN; CU; CZ; EE; GE; HU; IL; IS; JP; KG; KR; KZ; LC; LK; LR; LT; LV;
    MD; MG; MK; MN; MX; NO; NZ; PL; RO; RU; SG; SI; SK; SL; TJ; TM; TR;
    TT; UA; US; UZ; VN; YU; AM; AZ; BY; KG; KZ; MD; RU; TJ; TM
   (Regional) GH; KE; LS; MW; SD; SZ; UG; ZW; AT; BE; CH; DE; DK; ES; FI
   ; FR; GB; GR; IE; IT; LU; MC; NL; PT; SE; BF; BJ; CF; CG; CI; CM; GA;
  GN; ML; MR; NE; SN; TD; TG
 Filing Details:
                   WO 130000 With international search report; Before
   expiration of time limit for amending the claims and to be
   republished in the event of the receipt of the amendments
 IPC: * A61K
                       128(09)097715J; 128(09)097716K; 128(11)132435S;
 CA Abstract No: *
   128(09)097715J
 Derwent WPI Acc No: * C 98-110203; C 98-110207; C 98-145191; C
   98-110203
 Language of Document: English
                                      19980115
Patent (No, Kind, Date): WO 9801119 A2
 PHARMACEUTICAL COMPOSITIONS (English)
 Patent Assignee:
                    MERCK & CO INC (US); MITCHEL YALE B (US); TOBERT
   JONATHAN A (US)
 Author (Inventor): MITCHEL YALE B (US); TOBERT JONATHAN A (US)
 Priority (No, Kind, Date): GB 9617898
                                         Α
                                              19960828; US 21420 P
   19960709; US 29351 P
                          19961031
 Applic (No, Kind, Date): WO 97US10867 A
                                          19970703
 Designated States: (National) AL; AM; AU; AZ; BB; BG; BR; BY; CA; CN;
    CZ; EE; GE; HU; IL; IS; JP; KG; KR; KZ; LK; LR; LT; LV; MD; MG; MK;
    MN; MX; NO; NZ; PL; RO; RU; SG; SI; SK; SL; TJ; TM; TR; TT; UA; US;
    UZ; VN; YU; AM; AZ; BY; KG; KZ; MD; RU; TJ; TM (Regional) GH; KE;
    LS; MW; SD; SZ; UG; ZW; AT; BE; CH; DE; DK; ES; FI; FR; GB; GR; IE;
   IT; LU; MC; NL; PT; SE; BF; BJ; CF; CG; CI; CM; GA; GN; ML; MR; NE;
   SN; TD; TG
 Filing Details: WO 300000 Without international search report and to
   be republished upon receipt of that report
 IPC: * A61K-031/00
                       128(09)097715J; 128(09)097716K; 128(11)132435S;
 CA Abstract No: *
   128(11)132435$
 Derwent WPI Acc No: * C 98-110203; C 98-110207; C 98-145191; C
```

98-145191 Language of Document: English

WORLD INTELLEC	TUAL PROP	ERTY ORGANIZATION, PCT (WO)
		,Date,Code,Text):
WO 9801100		19960709 WO AA PRIORITY CLAIMED
NO 3001100	*	US 21420 P 19960709
WO 9801100	<b>D</b>	
WO 3801100	Р	GB 9617898 A 19960828
	•	
WO 9801100	P	
		US 29351 P 19961031
WO 9801100	P	
		DATA)
		WO 97US11792 A 19970703
WO 9801100	P	
		PUBLISHED APPLICATION WITHOUT SEARCH REPORT
		(DESIGNATED STATES CITED IN A PUBLISHED APPL.
		WITHOUT SEARCH REPORT)
		AL AM AU AZ BA BB BG BR BY CA CN CU CZ EE GE
		HU IL IS JP KG KR KZ LC LK LR LT LV MD MG MK
	*	MN MX NO NZ PL RO RU SG SI SK SL TJ TM TR TT
		UA US UZ VN YU AM AZ BY KG KZ MD RU TJ TM
WO 9801100	P	19980115 WO AL DESIGNATED COUNTRIES FOR
		REGIONAL PATENTS CITED IN A PUBLISHED
		APPLICATION WITHOUT SEARCH REPORT
		(DESIGNATED COUNTRIES FOR REGIONAL PATENTS
		CITED IN A PUBLISHED APPL. WITHOUT SEARCH
		REPORT)
		GH KE LS MW SD SZ UG ZW AT BE CH DE DK ES FI
		FR GB GR IE IT LU MC NL PT SE BF BJ CF CG CI
		CM GA GN ML MR NE SN TD TG
WO 9801100	P	19980115 WO A2 PUBLICATION OF THE
		INTERNATIONAL APPLICATION WITHOUT THE
		INTERNATIONAL SEARCH REPORT (PUB. OF THE
		INTERNATIONAL APPL. WITHOUT THE INTERNATIONAL
		SEARCH REPORT)
WO 9801100	P	19980326 WO DFPE REQUEST FOR PRELIMINARY
	_	EXAMINATION FILED PRIOR TO EXPIRATION OF 19TH
		MONTH FROM PRIORITY DATE
WO 9801100	Þ	19980520 WO 121 EP: PCT APP. ART. 158 (1)
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	-	(EP: PCT ANM. ART. 158 (1))
WO 9801100	P	19990604 WO NENP NON-ENTRY INTO THE NATIONAL
3001100	-	PHASE IN:
		J <u>P</u> 1998505308
WO 9801100	Þ	
WO 3001100	•	PHASE IN:
		CA_
WO 9801100	D	
WO 7001100	E	PHASE (EP: PCT ANM. NICHT IN EUROP. PHASE
		EING.)
WO 9801116	P	19960709 WO AA PRIORITY CLAIMED
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	E	US 21420 P 19960709
WO 9801116	P	
## 3001110	F	GB 9617898 A 19960828
WO 9801116	P	
MO 3001110	r	
WO 000111C	<b>D</b>	US 29351 P 19961031 19970703 WO AE APPLICATION DATA (APPL.
WO 9801116	P	133/0/03 WO AE APPLICATION DATA (APPL.

WO	9801116	P	DATA) WO 97US12426 A 19970703  19980115 WO AK DESIGNATED STATES CITED IN A PUBLISHED APPLICATION WITH SEARCH REPORT (DESIGNATED STATES CITED IN A PUBLISHED APPL. WITH SEARCH REPORT) AL AM AU AZ BB BG BR BY CA CN CZ EE GE HU IL
WO	9801116	P	IS JP KG KR KZ LK LR LT LV MD MG MK MN MX NO NZ PL RO RU SG SI SK SL TJ TM TR TT UA US UZ VN YU AM AZ BY KG KZ MD RU TJ TM  19980115 WO AL DESIGNATED COUNTRIES FOR REGIONAL PATENTS CITED IN A PUBLISHED APPLICATION WITH SEARCH REPORT (DESIGNATED COUNTRIES FOR REGIONAL PATENTS CITED IN A
WO	9801116	р	PUBLISHED APPL. WITH SEARCH REPORT)  GH KE LS MW SD SZ UG ZW AT BE CH DE DK ES FI  FR GB GR IE IT LU MC NL PT SE BF BJ CF CG CI  CM GA GN ML MR NE SN TD TG  19980115 WO A1 PUBLICATION OF THE
,,,	3001110	•	INTERNATIONAL APPLICATION WITH THE INTERNATIONAL SEARCH REPORT (PUB. OF THE INTERNATIONAL APPL. WITH THE INTERNATIONAL SEARCH REPORT)
	9801116		EXAMINATION FILED PRIOR TO EXPIRATION OF 19TH MONTH FROM PRIORITY DATE
WO	9801116	P	19980506 WO 121 EP: PCT APP. ART. 158 (1) (EP: PCT ANM. ART. 158 (1))
WO	9801116	P	19990604 WO NENP NON-ENTRY INTO THE NATIONAL PHASE IN:
	9801116		PHASE IN:
			20000112 WO 122 EP: PCT APP. NOT ENT. EUROP. PHASE (EP: PCT ANM. NICHT IN EUROP. PHASE EING.)
WO	9801119	P	19960709 WO AA PRIORITY CLAIMED US 21420 P 19960709
WO	9801119	P	19960828 WO AA PRIORITY (PATENT) GB 9617898 A 19960828
WO			
	9801119	P	19961031 WO AA PRIORITY CLAIMED
WO	9801119 9801119		19961031 WO AA PRIORITY CLAIMED US 29351 P 19961031 19970703 WO AE APPLICATION DATA (APPL. DATA)
WO	9801119 9801119	P P	19961031 WO AA PRIORITY CLAIMED US 29351 P 19961031 19970703 WO AE APPLICATION DATA (APPL. DATA) WO 97US10867 A 19970703

			(DESIGNATED COUNTRIES FOR REGIONAL PATENTS
			CITED IN A PUBLISHED APPL. WITHOUT SEARCH
			REPORT)
			GH KE LS MW SD SZ UG ZW AT BE CH DE DK ES FI
			FR GB GR IE IT LU MC NL PT SE BF BJ CF CG CI
			CM GA GN ML MR NE SN TD TG
พด	9801119	P	19980115 WO A2 PUBLICATION OF THE
""	7001111		INTERNATIONAL APPLICATION WITHOUT THE
			INTERNATIONAL SEARCH REPORT (PUB. OF THE
			INTERNATIONAL APPL. WITHOUT THE INTERNATIONAL
			SEARCH REPORT)
WO	9801119	P	19980312 WO DFPE REQUEST FOR PRELIMINARY
			EXAMINATION FILED PRIOR TO EXPIRATION OF 19TH
			MONTH FROM PRIORITY DATE
WO	9801119	P	19980506 WO 121 EP: PCT APP. ART. 158 (1)
			(EP: PCT ANM. ART. 158 (1))
WO	9801119	P	19990604 WO NENP NON-ENTRY INTO THE NATIONAL
			PHASE IN:
			JP 1998505217
WO	9801119	P	19991110 WO 122 EP: PCT APP. NOT ENT. EUROP
			PHASE (EP: PCT ANM. NICHT IN EUROP. PHASE
			EING.)
WO	9801119	P	20000109 WO NENP NON-ENTRY INTO THE NATIONAL
			PHASE IN:
			CA

# This Page is Inserted by IFW Indexing and Scanning Operations and is not part of the Official Record

# **BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:
☐ BLACK BORDERS
☐ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
☐ FADED TEXT OR DRAWING
☐ BLURRED OR ILLEGIBLE TEXT OR DRAWING
☐ SKEWED/SLANTED IMAGES
☐ COLOR OR BLACK AND WHITE PHOTOGRAPHS
GRAY SCALE DOCUMENTS
☐ LINES OR MARKS ON ORIGINAL DOCUMENT
☐ REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
· · · · · · · · · · · · · · · · · · ·

# IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.